

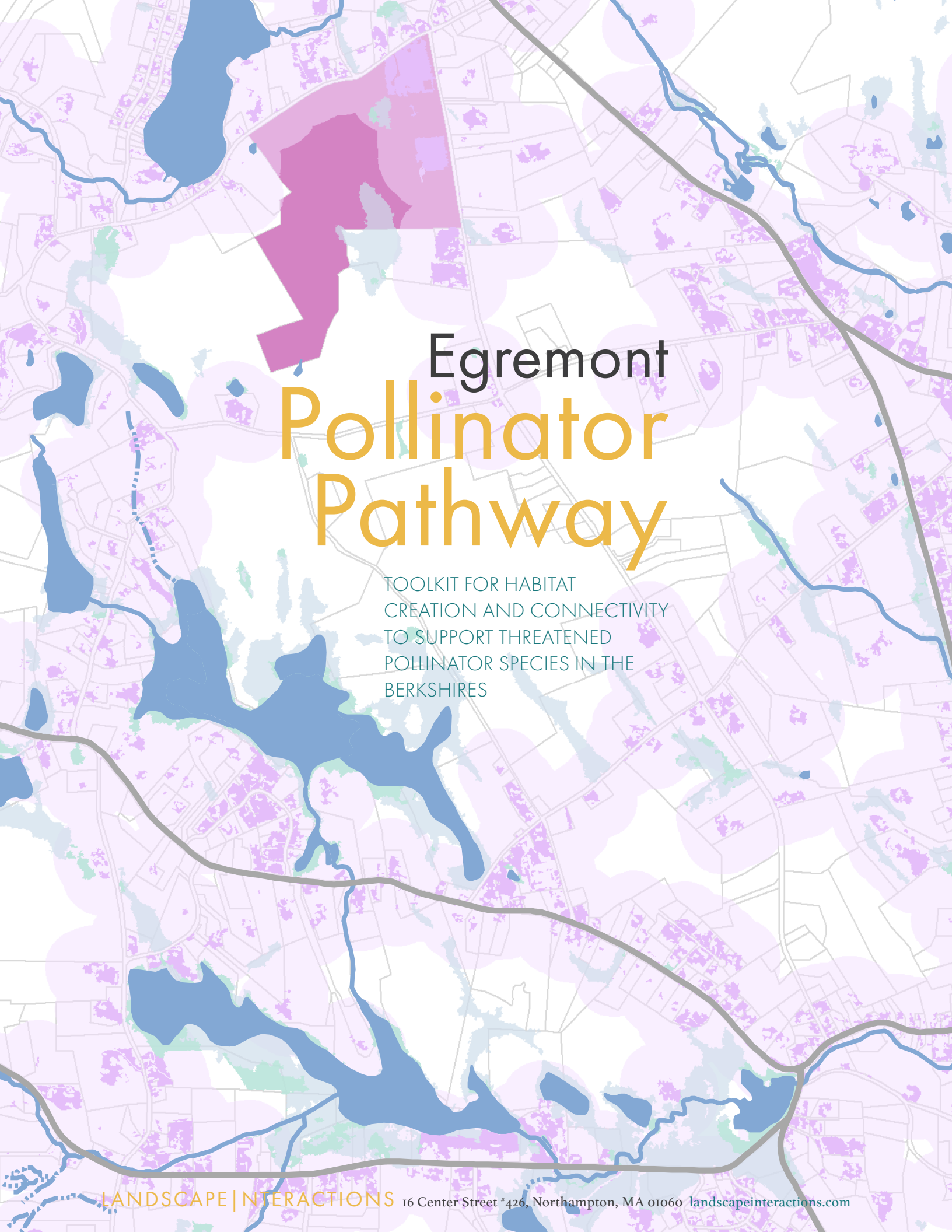
Egremont Pollinator Pathway

TOOLKIT FOR HABITAT
CREATION AND CONNECTIVITY
TO SUPPORT THREATENED
POLLINATOR SPECIES IN THE
BERKSHIRES

Commissioned by the Egremont
Agricultural Commission

a project of
LANDSCAPE | INTERACTIONS

written and designed by
Evan Abramson



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Thank you: Elizabeth Keen, Abigail Rogers-McKee, Tom Reynolds, Will Conklin and Greenagers, Indian Line Farm crew, Mary McGurn for the photographs, Vivian Orlowski for suggesting the idea, and the citizens of Egremont for getting their hands dirty.

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Opposite: Design planset during French Park installation October 2020. Photograph courtesy McGurn Media. Following page (clockwise from top): Mountain lion by Wisconsin Department of Natural Resources; Bald eagle by Steven M. Bellovin; Bobcat by Forest Wander; Coyote by Brennan Lindsay; Black-capped Chickadee by Tim Sackton; White tailed deer by Henry Mulligan; Eastern cottontail by Ryan Hoddnet; Wood frog by K.P. McFarland; Salix petiolaris by unknown; Bombus vagans by Norm Levey; Vaccinium macrocarpon by G. Mittelhauser; West Virginia White by M. Silver; Raccoon by MWanner; White footed mouse by Capri23auto; Common raven by Andrew Lunt.

French Park Pollinator

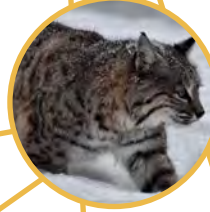
Egremont, WA

PLANT SCHEDULE

CODE	COMMON NAME	BOTANICAL NAME
CER CAN	Cornus canadensis	Cornus canadensis
SAL BSA	Salix baccata	Salix baccata
SAL DCA	Salix discolor	Salix discolor
SAL PET	Salix petiolaris	Salix petiolaris
SAL RTR	Salix rostrata	Salix rostrata
COSE	Corylus americana	Corylus americana
CEP DCC	Cephaelis dioica	Cephaelis dioica
ROS RUB	Rosa rubra	Rosa rubra
ROS PET	Rosa petraea	Rosa petraea
ROS PAL	Rosa palustris	Rosa palustris
ROS VIR	Rosa virginiana	Rosa virginiana
RUO ODO	Rubus odoratus	Rubus odoratus
SAM NIG	Sambucus nigra	Sambucus nigra
EPH ALB	Ephedra alba	Ephedra alba
EPH TOR	Ephedra torreyana	Ephedra torreyana
VAC ANG	Vaccinium angustifolium	Vaccinium angustifolium
VAC COB	Vaccinium corymbosum	Vaccinium corymbosum
VAC MAC	Vaccinium macrocarpon	Vaccinium macrocarpon
COSE	Corylus americana	Corylus americana
AND GER	Andropogon gerardii	Andropogon gerardii
CAN STR	Carex stricta	Carex stricta
CHA LAT	Chamaenerion latifolium	Chamaenerion latifolium



TERTIARY
CONSUMERS



SECONDARY
CONSUMERS



PRIMARY
CONSUMERS

Plants Matter

A truly "pollinator-friendly" landscape is highly diverse in both plant and animal species composition and includes a wide range of native plant types, ensuring that pollen and nectar are available throughout the growing season; and that nesting habitat and host plants are available throughout the year. The focus of this Toolkit is to provide the recommended plants and landscape management strategies to support native pollinator species that are threatened in the Berkshires of Western Massachusetts. The loss of these pollinator-plant interactions, or pollination systems, can have catastrophic consequences on the biodiversity of the state, and the region as a whole. But it's not too late to start planting.



PRODUCERS AND
DECOMPOSERS

Why Pollinators?

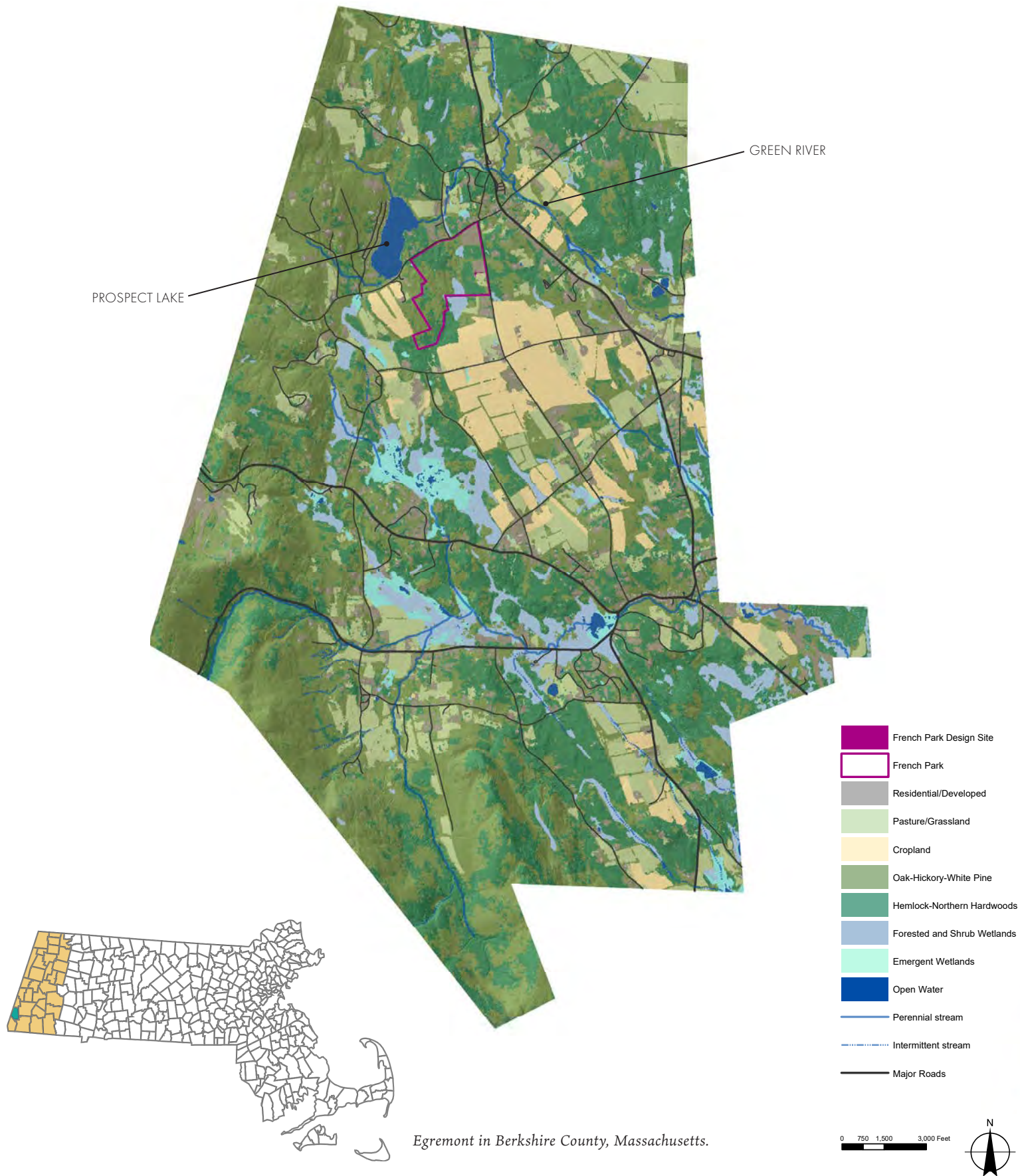
Native pollinators are vital to creating and maintaining the habitats and ecosystems that most animals rely on for food and shelter — including humans. Just like humans, pollinators need nutrient-dense food, shelter, and successful reproduction to thrive. But not all species require the same thing. A delicate balance exists between native plants and their pollinators, relationships that evolved over millions of years. Some plants have a small guild of species which coevolved with them to ensure their pollination. Similarly, approximately 15% of northeastern native bees are considered pollen specialists (Fowler, 2016). For many specialists, once their “partner” is missing from the landscape, they cannot reproduce — and thus risk becoming extirpated, endangered (and eventually, extinct).

A major misconception about pollinator decline is that all species are declining at the same rate. In fact, many species are actually increasing in abundance and geographic distribution as a direct result of human disturbance. “Seeing lots of bees” does not necessarily mean that your landscape is pollinator-friendly. Unfortunately, most efforts to restore pollination systems to date have resulted in increasing the numbers of a few common bee, butterfly and moth species, rather than on *the range of wild pollinator species needed* for ecosystem health and resiliency.

Bombus fervidus foraging on Monarda didyma (scarlet beebalm). One of the most abundant bumblebee species in Massachusetts a few decades ago, it is now the second rarest bumblebee species in the state. Photograph by Norm Levey.



LAND USE AND NATURAL COMMUNITIES IN EGREMONT



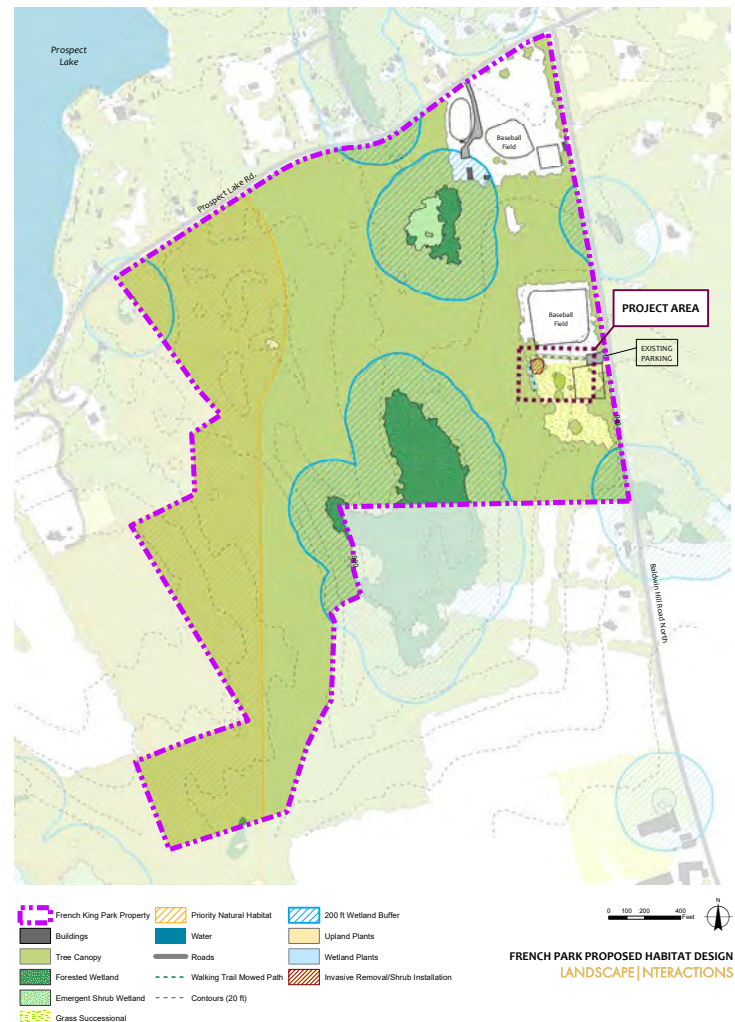
Project Context

The Town of Egremont is located in southwestern Berkshire County, where the Western New England Marble Valleys meet the Taconic Mountains. Nearly all of the town falls within the Housatonic River watershed. Over 15% of the town's 18.9 square miles is in agricultural use, and approximately 26% is permanently protected. While less than 1% of the town is open water, wetlands constitute nearly 10% of the town's total area. Of those wetlands, approximately 222 acres are emergent, or not under forest or shrub cover. Residential and developed areas in Egremont comprise nearly 8% of the town, or 916 acres. Most development in Egremont is focused in the lowlands, including land along the floodplains of Hubbard Brook and the Green River.

The central and eastern lowlands of Egremont, comprising nearly 75% of the town's total area, are part of the Western New England Marble Valleys ecoregion, one of the most distinct and biologically rich areas in Massachusetts as well as New England (BioMap2, 2011). The marble valleys support an impressively high percentage of Massachusetts' state-listed species and Priority Natural Communities. Extensive wetland areas within this ecoregion in Egremont support many threatened species that rely on calcareous wet meadows and fens for survival.

French Park is a 136-acre public park in North Egremont that is situated within this biologically rich Marble Valleys ecoregion. The site consists of a mix of wet meadows, forested wetlands, upland forest and developed open space in the form of a dog park and ball fields.

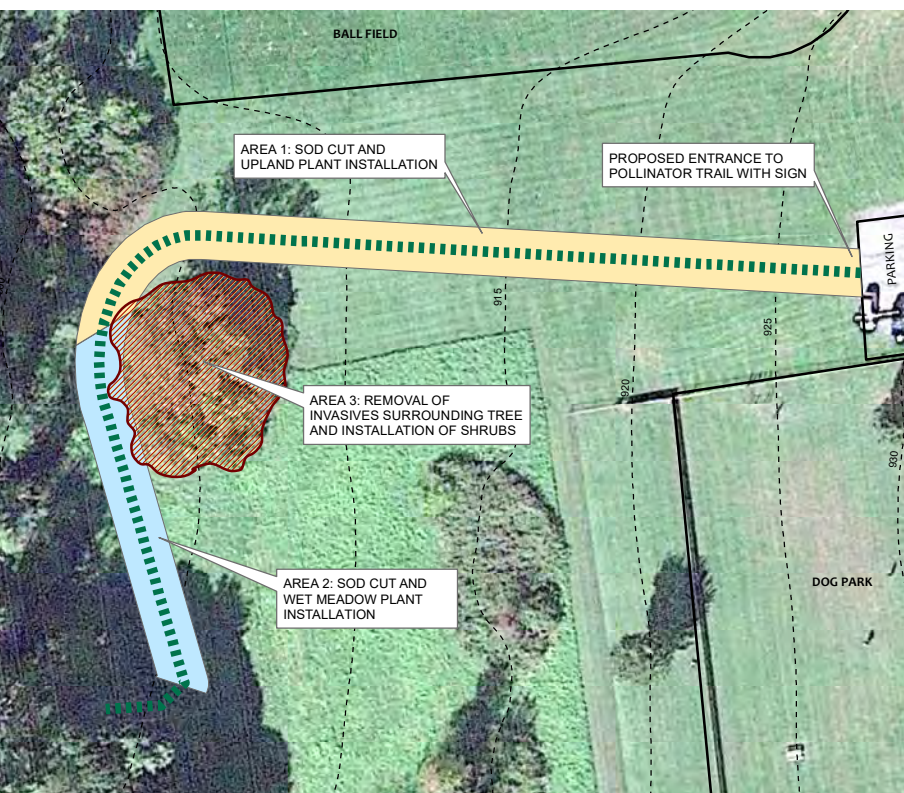
At a public meeting held in October 2019, it was determined that French Park would be the ideal location in Egremont for a demonstration landscape design to support threatened pollinator species, as the site was public; highly visible; owned and managed by the town; and comprised of a variety of ecological conditions which could be replicated on other properties in the town. The meeting was convened by Elizabeth Keen, Chair of the Egremont Agricultural Commission, and in attendance were members of the Egremont Select Board; Garden Club; Green Committee; Conservation Commission; Town Groundskeeper Tom Reynolds; Will Conklin, Executive Director of Greenagers; and Evan Abramson, Principal of Landscape Interactions.





Creating Habitat

On the weekend of October 24-25, 2020, citizens in Egremont braved cold rain and winds and installed almost 10,000 sq.ft of plants stretching from the French Park Dog Park parking lot to the forest edge. The installation encompassed upland meadow, woodland edges and wet meadow habitat; and included 38 species of native shrubs, forbs, graminoids and trees. All of the plants were selected to support at-risk bees and butterflies endemic to high elevation Western Massachusetts, based upon field observations and historical research by Dr. Robert Gegear over the 2020 growing season. *See the following pages for more information about the plants selected and the species they support.*



Draft of French Park design with habitat areas delineated.



*Installation of Pollinator Pathway in French Park.
Photographs courtesy of McGurn Media.*

The Pollinator Pathway installation in French Park represented a town-wide collaboration across sectors and experiences. Town Groundskeeper Tom Reynolds, Greenagers and the Indian Line Farm crew were instrumental in preparing the site for planting, by removing over 3,000 sq.ft of invasive bittersweet, barberry and honeysuckle, as well as nearly 7,000 sq.ft of sod.

Volunteers from across town showed up on both planting days, installing over 1,200 plugs and potted plants across three areas of habitat (see design draft on opposite page).



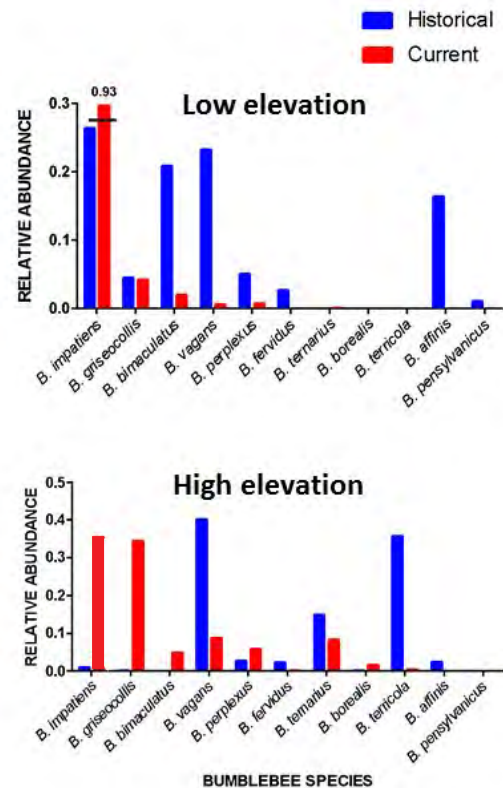
THE STATUS OF BUMBLEBEE SPECIES IN MASSACHUSETTS (1960-2019)



Bombus impatiens



Bombus fervidus



Images and data courtesy Dr. Robert Gegear and Yale Peabody Museum of Natural History.

Pollinator Decline in Massachusetts

By tracking bee, butterfly and moth observations over the past 150+ years, we get an accurate picture of pollinator health in the state. The situation isn't so great: the number of bumblebee species has dropped from 11 to nine, with three more species (*Bombus fervidus*, *Bombus terricola* and *Bombus vagans*) in danger of being extirpated within the next decade. MassWildlife lists five more bees and 44 butterflies and moths as Species of Greatest Conservation Need (Massachusetts Division of Fisheries and Wildlife, 2015). These losses risk cascading impacts across ecosystems. If trends continue, human actions will remove too many species and natural systems will begin to collapse.

Photographs (clockwise from top):
Aphrodite Fritillary by Andrea Janda;
Bombus terricola by K.P. McFarland;
Bog Coppers by Jim Brighton; Bombus
affinis by Serina Jepsen.

At-Risk Pollinators Supported by this Toolkit

Bees:

- » *Bombus affinis* Rusty patched bumblebee
- » *Bombus fervidus* Golden northern bumblebee
- » *Bombus pensylvanicus* American bumblebee
- » *Bombus terricola* Yellow-banded bumblebee
- » *Bombus vagans* Half-black bumblebee

Butterflies:

- » *Amblyscirtes hegon* Pepper and Salt Skipper
- » *Amblyscirtes vialis* Common Roadside-Skipper
- » *Boloria bellona* Meadow Fritillary
- » *Callophrys irus* Frosted Elfin
- » *Carterocephalus palaemon* Arctic Skipper
- » *Chlosyne harrisii* Harris' Checkerspot
- » *Erora laeta* Early Hairstreak
- » *Euphyes bimacula* Two-spotted Skipper
- » *Euphyes conspicua* Black Dash
- » *Euphyes dion* Dion Skipper
- » *Hesperia leonardus* Leonard's Skipper
- » *Hesperia metea* Cobweb Skipper
- » *Hesperia sassacus* Indian Skipper
- » *Lycaena epixanthe* Bog Copper
- » *Lycaena hyllus* Bronze Copper
- » *Pieris oleracea* Mustard White
- » *Pieris virginianensis* West Virginia White
- » *Poanes massasoit* Mulberry Wing
- » *Polygonia progne* Gray Comma
- » *Satyrium acadica* Acadian Hairstreak
- » *Satyrium favonius* Oak Hairstreak
- » *Speyeria aphrodite* Aphrodite Fritillary
- » *Speyeria atlantis* Atlantis Fritillary




BIGGEST THREATS FACING POLLINATORS

- » **Habitat Loss**
(agriculture + human development)
- » **Pesticides**
- » **Climate Change**



What You Can Do

The good news is, there's a lot that can be done on the part of individuals and communities. That's where this Toolkit comes in. By following the plant lists and habitat management guidelines outlined on the following pages, citizens in Egremont and in towns across the Berkshires can attract and sustain threatened pollinator species at their homes or sites — building local networks of biodiversity, ecosystem health and climate resiliency through pollinator-plant interactions.



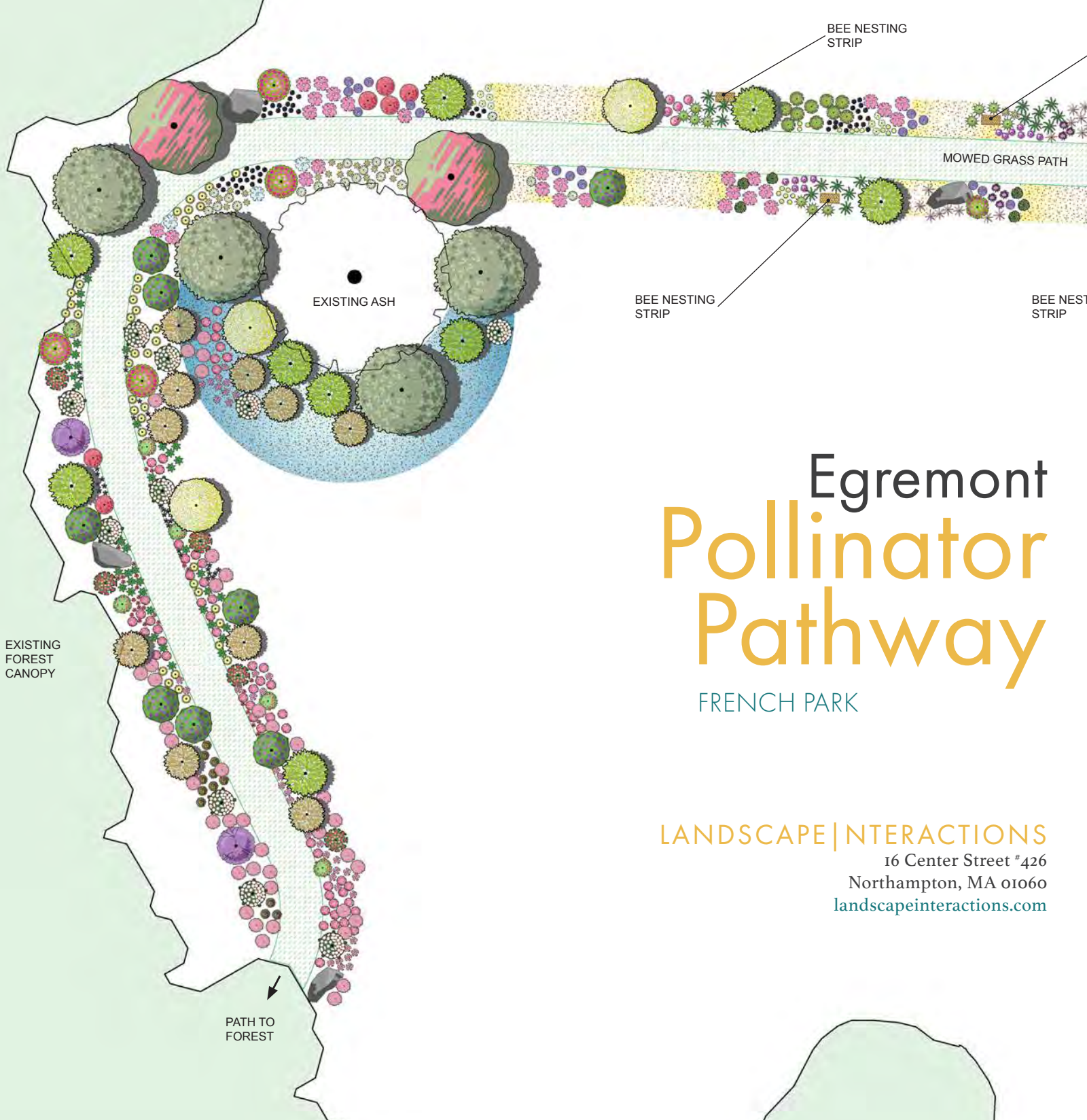
This page, clockwise from top: Rosa virginiana; Mimulus ringens; Bombus vagans by Norm Levey; Eutrochium fistulosum; Mulberry wing on Asclepias syriaca; Doellingeria (Aster) umbellata; Physostegia virginiana; Salix bebbiana; Black dash; Panicum virgatum; Chasmanthium latifolium; Early Hairstreak by Bruce deGraaf; Prunella vulgaris ssp. lanceolata; Cercis canadensis. Opposite page, clockwise from bottom: Zizia aurea; Vaccinium angustifolium; Rubus odoratus; Ribes rubrum; Penstemon hirsutus; Bombus ternarius on Salix discolor; Spirea alba.



Recommended Plants for the Berkshire Region*

Latin Name	Common Name	Latin Name	Common Name
<i>Agastache scrophulariaefolia</i>	Purple giant hyssop	<i>Prunella vulgaris ssp. lanceolata</i>	Common selfheal
<i>Andropogon gerardii</i>	Big bluestem	<i>Ribes rubrum</i>	Red currant
<i>Asclepias incarnata</i>	Swamp milkweed	<i>Rosa nitida</i>	Shining rose
<i>Asclepias syriaca</i>	Common milkweed	<i>Rosa palustris</i>	Swamp rose
<i>Cardamine concatenata</i>	Toothwort	<i>Rosa virginiana</i>	Virginia rose
<i>Cardamine diphylla</i>	Two-leaved toothwort	<i>Rubus odoratus</i>	Purple-flowering raspberry
<i>Carex brevior</i>	Plains oval sedge	<i>Rumex orbiculatus</i>	Great water dock
<i>Carex stricta</i>	Tussock sedge	<i>Salix bebbiana</i>	Bebb's willow
<i>Cephalanthus occidentalis</i>	Buttonbush	<i>Salix discolor</i>	Pussy willow
<i>Cercis canadensis</i>	Redbud	<i>Salix petiolaris</i>	Meadow willow
<i>Chasmanthium latifolium</i>	River oats	<i>Salix sericea</i>	Silky willow
<i>Cirsium muticum</i>	Swamp thistle	<i>Sambucus nigra</i>	Black elderberry
<i>Doellingeria umbellata</i>	Tall white aster	<i>Schizachyrium scoparium</i>	Little bluestem
<i>Eragrostis spectabilis</i>	Purple Lovegrass	<i>Solidago altissima</i>	Tall goldenrod
<i>Eutrochium fistulosum</i>	Hollow Joe-Pye weed	<i>Solidago arguta</i>	Forest goldenrod
<i>Geranium maculatum</i>	Spotted crane's-bill	<i>Solidago caesia</i>	Axillary goldenrod
<i>Hypericum kalmianum</i>	Kalm's St. John's-wort	<i>Solidago juncea</i>	Early goldenrod
<i>Lobelia siphilitica</i>	Blue lobelia	<i>Solidago odora</i>	Sweet goldenrod
<i>Lupinus perennis</i>	Wild lupine	<i>Solidago speciosa</i>	Showy Goldenrod
<i>Mimulus ringens</i>	Allegheny monkeyflower	<i>Spiraea alba</i>	White meadowsweet
<i>Monarda didyma</i>	Scarlet beebalm	<i>Spiraea tomentosa</i>	Steeplebush
<i>Monarda fistulosa</i>	Wild bergamot	<i>Symphyotrichum lateriflorum</i>	Calico aster
<i>Monarda punctata</i>	Spotted beebalm	<i>Symphyotrichum novi-belgii</i>	New York American-aster
<i>Panicum virgatum</i>	Switchgrass	<i>Symphyotrichum puniceum</i>	Purple-stemmed American-aster
<i>Pedicularis canadensis</i>	Canadian wood betony	<i>Vaccinium angustifolium</i>	Lowbush blueberry
<i>Penstemon digitalis</i>	Foxglove beardtongue	<i>Vaccinium corymbosum</i>	Highbush blueberry
<i>Penstemon hirsutus</i>	Northeastern beardtongue	<i>Vaccinium macrocarpon</i>	Large cranberry
<i>Physostegia virginiana</i>	Obedient false dragonhead	<i>Zizia aurea</i>	Golden Alexanders

*Plant recommendations are site-specific and based on landscape conditions at French Park.



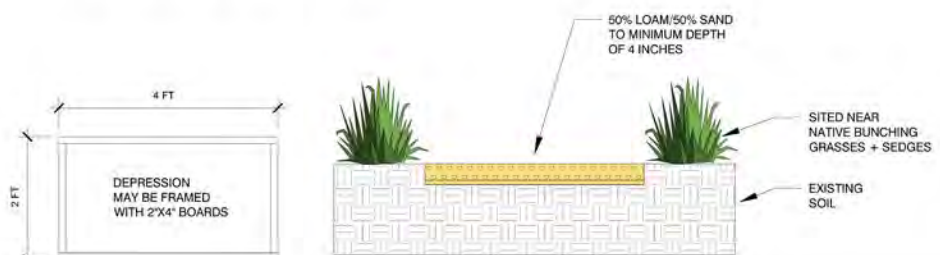
Egremont Pollinator Pathway

FRENCH PARK

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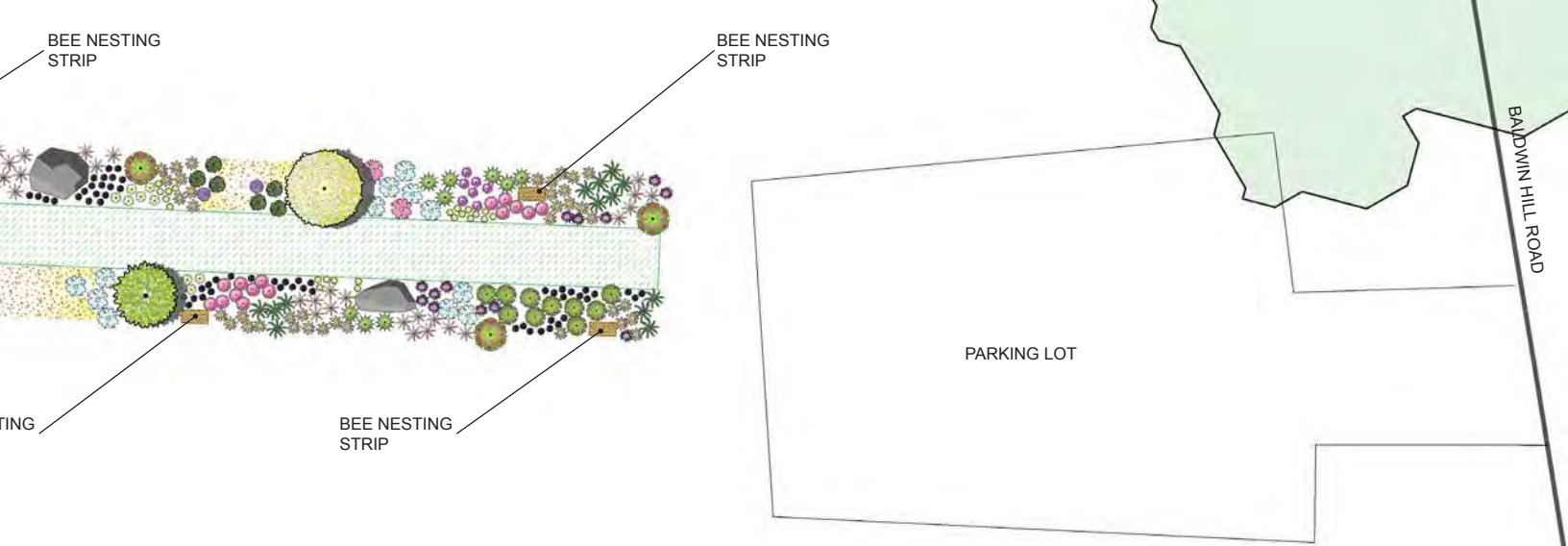
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BEE NESTING STRIP DETAIL


































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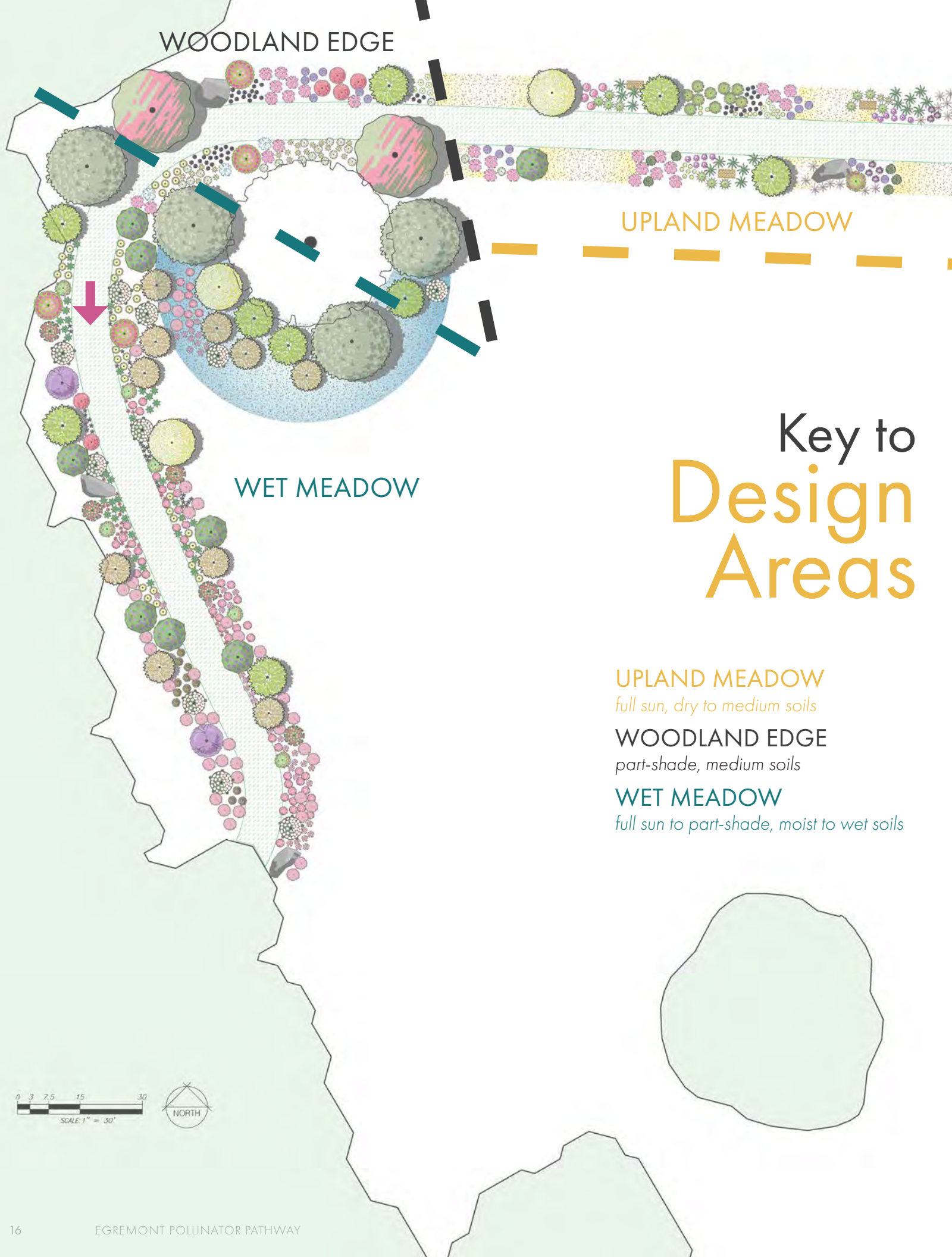


PLANT SCHEDULE

TREES	BOTANICAL NAME	COMMON NAME	QTY	REMARKS
	<i>Cercis canadensis</i>	Eastern Redbud	2	20' wide spacing
	<i>Salix bebbiana</i>	Beaked Willow	4	20' wide spacing
	<i>Salix discolor</i>	Pussy Willow	10	8' wide spacing
	<i>Salix petiolaris</i>	Meadow Willow	10	10' wide spacing
	<i>Salix sericea</i>	Silky Willow	4	12' wide spacing
SHRUBS	BOTANICAL NAME	COMMON NAME	QTY	REMARKS
	<i>Cephalanthus occidentalis</i>	Buttonbush	10	6' wide spacing
	<i>Ribes rubrum</i>	Red Currant	6	4' wide spacing
	<i>Rosa nitida</i>	Shining Rose	6	4' wide spacing
	<i>Rosa palustris</i>	Swamp Rose	5	5' wide spacing
	<i>Rosa virginiana</i>	Virginia Rose	4	5' wide spacing
	<i>Rubus odoratus</i>	Purple-flowering Raspberry	4	7' wide spacing
	<i>Sambucus nigra</i>	Black Elderberry	2	8' wide spacing
	<i>Spiraea alba</i>	Meadowsweet	15	3' wide spacing
	<i>Spiraea tomentosa</i>	Steeplebush	30	3' wide spacing
	<i>Vaccinium angustifolium</i>	Lowbush Blueberry	20	3' wide spacing
	<i>Vaccinium corymbosum</i>	Highbush Blueberry	8	8' wide spacing
	<i>Vaccinium macrocarpon</i>	American Cranberry	12	2' wide spacing
GRASSES	BOTANICAL NAME	COMMON NAME	QTY	REMARKS
	<i>Andropogon gerardii</i>	Big Bluestem	30	3' wide spacing
	<i>Carex stricta</i>	Tussock Sedge	40	2' wide spacing
	<i>Chasmanthium latifolium</i>	River Oats	40	2' wide spacing

	<i>Panicum virgatum</i>	Switchgrass	20	3' wide spacing
	<i>Schizachyrium scoparium</i>	Little Bluestem	40	2.5' wide spacing
PERENNIALS	BOTANICAL NAME	COMMON NAME	QTY	REMARKS
	<i>Asclepias incarnata</i>	Swamp Milkweed	60	2' wide spacing
	<i>Asclepias syriaca</i>	Common Milkweed	20	2' wide spacing
	<i>Doellingeria umbellata</i>	Flat-topped Aster	40	2' wide spacing
	<i>Eutrochium fistulosum</i>	Hollow Joe-Pye Weed	40	3' wide spacing
	<i>Hypericum kalmianum</i>	Kalm St. John's-wort	12	2.5' wide spacing
	<i>Lobelia siphilitica</i>	Blue Lobelia	30	1' wide spacing
	<i>Mimulus ringens</i>	Monkeyflower	30	1' wide spacing
	<i>Monarda fistulosa</i>	Wild Bergamot	20	2' wide spacing
	<i>Penstemon digitalis</i>	Foxglove Beardtongue	20	1.5' wide spacing
	<i>Penstemon hirsutus</i>	Northeastern Beardtongue	20	1.5' wide spacing
	<i>Physostegia virginiana</i>	Obedient Plant	40	1.5' wide spacing
	<i>Prunella vulgaris</i>	Self-Heal	116	1' wide spacing
	<i>Solidago caesia</i>	Blue-stemmed Goldenrod	20	1.5' wide spacing
	<i>Symphyotrichum lateriflorum</i>	Calico Aster	20	2' wide spacing
	<i>Symphyotrichum novi-belgii</i>	New York Aster	20	2' wide spacing
	<i>Zizia aurea</i>	Golden Alexanders	40	1' wide spacing
GROUND COVERS	BOTANICAL NAME	COMMON NAME	QTY	REMARKS
	Dry Mix	Upland Meadow Seed Mix	871 sf	110 PLS/sf
	Wet Mix	Wet Meadow Seed Mix	1,824 sf	110 PLS/sf

Refer to page 18 for more information regarding the plants used in the design.



WOODLAND EDGE

UPLAND MEADOW

WET MEADOW

Key to Design Areas

UPLAND MEADOW

full sun, dry to medium soils

WOODLAND EDGE

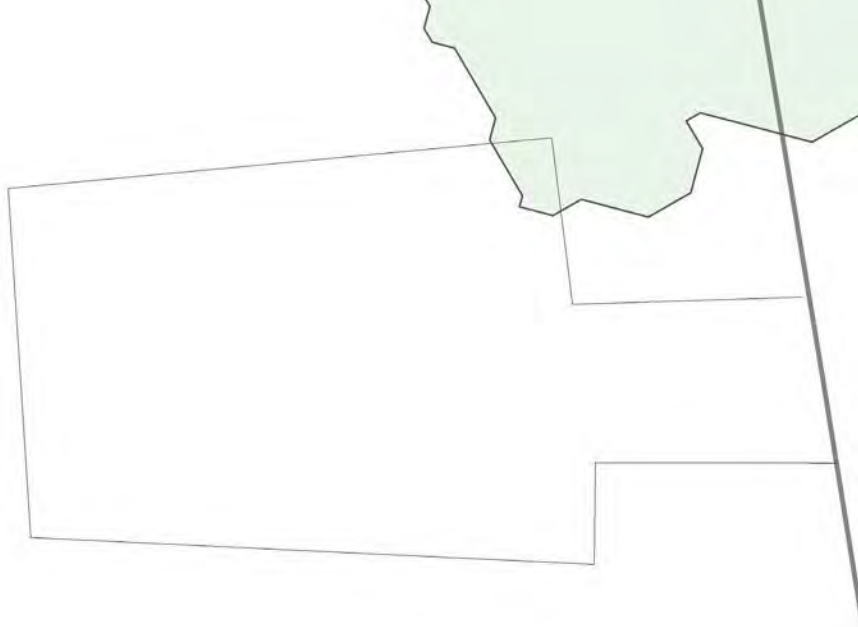
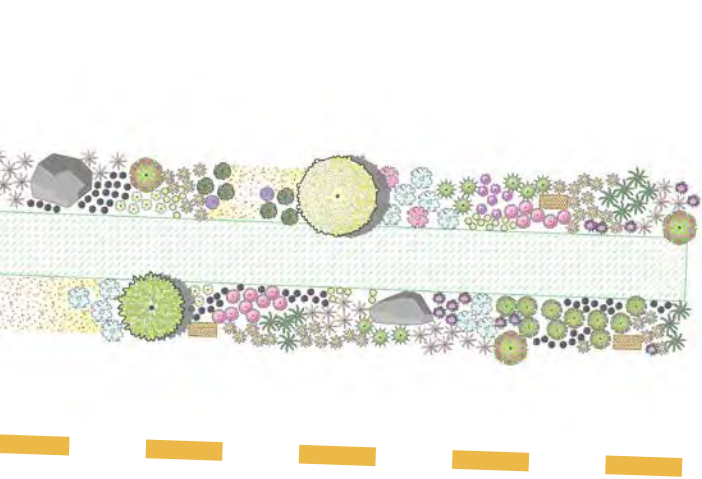
part-shade, medium soils

WET MEADOW

full sun to part-shade, moist to wet soils

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

















































Below: conceptual rendering of the Wet Meadow area facing south (see opposite). Right: Wet Meadow one month before installation.



KEY TO DESIGN AREAS

		
UPLAND MEADOW	WOODLAND EDGE	WET MEADOW

PLANT SCHEDULE

TREES	BOTANICAL NAME	COMMON NAME						
	Cercis canadensis	Eastern Redbud				Panicum virgatum	Switchgrass	
	Salix bebbiana	Beaked Willow				Schizachyrium scoparium	Little Bluestem	
	Salix discolor	Pussy Willow			PERENNIALS	BOTANICAL NAME	COMMON NAME	
	Salix petiolaris	Meadow Willow				Asclepias incarnata	Swamp Milkweed	
	Salix sericea	Silky Willow				Asclepias syriaca	Common Milkweed	
						Doellingeria umbellata	Flat-topped Aster	
SHRUBS	BOTANICAL NAME	COMMON NAME				Eutrochium fistulosum	Hollow Joe-Pye Weed	
	Cephalanthus occidentalis	Buttonbush				Hypericum kalmianum	Kalm St. John`s-wort	
	Ribes rubrum	Red Currant				Lobelia siphilitica	Blue Lobelia	
	Rosa nitida	Shining Rose				Mimulus ringens	Monkeyflower	
	Rosa palustris	Swamp Rose				Monarda fistulosa	Wild Bergamot	
	Rosa virginiana	Virginia Rose				Penstemon digitalis	Foxglove Beardtongue	
	Rubus odoratus	Purple-flowering Raspberry				Penstemon hirsutus	Northeastern Beardtongue	
	Sambucus nigra	Black Elderberry				Physostegia virginiana	Obedient Plant	
	Spiraea alba	Meadowsweet				Prunella vulgaris	Self-Heal	
	Spiraea tomentosa	Steeplebush				Solidago caesia	Blue-stemmed Goldenrod	
	Vaccinium angustifolium	Lowbush Blueberry				Symphyotrichum lateriflorum	Calico Aster	
	Vaccinium corymbosum	Highbush Blueberry				Symphyotrichum novi-belgii	New York Aster	
	Vaccinium macrocarpon	American Cranberry				Zizia aurea	Golden Alexanders	
GRASSES	BOTANICAL NAME	COMMON NAME			GROUND COVERS	BOTANICAL NAME	COMMON NAME	
	Andropogon gerardii	Big Bluestem				Dry Mix	Upland Meadow Seed Mix	
	Carex stricta	Tussock Sedge				Wet Mix	Wet Meadow Seed Mix	
	Chasmanthium latifolium	River Oats						

Egremont Pollinator Pathway

FRENCH PARK

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FRENCH PARK UPLAND MEADOW SEED MIX

Shrubs

<i>Spiraea alba</i>	Meadowsweet
<i>Spiraea tomentosa</i>	Steeplebush

Forbs

<i>Agastache scrophulariifolia</i>	Purple giant hyssop
<i>Asclepias syriaca</i>	Common milkweed
<i>Doellingeria umbellata</i>	Tall white aster
<i>Geranium maculatum</i>	Spotted crane's-bill
<i>Lupinus perennis</i>	Wild lupine
<i>Monarda fistulosa</i>	Wild bergamot
<i>Monarda punctata</i>	Spotted beebalm
<i>Pedicularis canadensis</i>	Canadian lousewort
<i>Penstemon digitalis</i>	Foxglove beardtongue
<i>Penstemon hirsutus</i>	Northeastern beardtongue
<i>Solidago caesia</i>	Blue-stemmed goldenrod
<i>Solidago juncea</i>	Early goldenrod
<i>Solidago odora</i>	Sweet goldenrod
<i>Solidago speciosa</i>	Showy goldenrod
<i>Symphotrichum lateriflorum</i>	Calico American-aster
<i>Zizia aurea</i>	Golden Alexanders

Graminoids

<i>Andropogon gerardii</i>	Big bluestem
<i>Carex brevior</i>	Plains oval sedge
<i>Chasmanthium latifolium</i>	River oats
<i>Eragrostis spectabilis</i>	Purple lovegrass
<i>Panicum virgatum</i>	Switchgrass
<i>Schizachyrium scoparium</i>	Little bluestem

FRENCH PARK WET MEADOW SEED MIX

Forbs

<i>Asclepias incarnata</i>	Swamp milkweed
<i>Cirsium muticum</i>	Swamp thistle
<i>Doellingeria umbellata</i>	Tall white aster
<i>Eutrochium fistulosum</i>	Hollow Joe-Pye weed
<i>Lobelia siphilitica</i>	Great blue lobelia
<i>Mimulus ringens</i>	Allegheny monkey flower
<i>Rumex orbiculatus</i>	Great Water Dock
<i>Symphotrichum novi-belgii</i>	New York American-aster
<i>Symphotrichum puniceum</i>	Purple-stemmed American-aster

Graminoids

<i>Carex stricta</i>	Tussock sedge
<i>Chasmanthium latifolium</i>	River oats

Mowing Regime

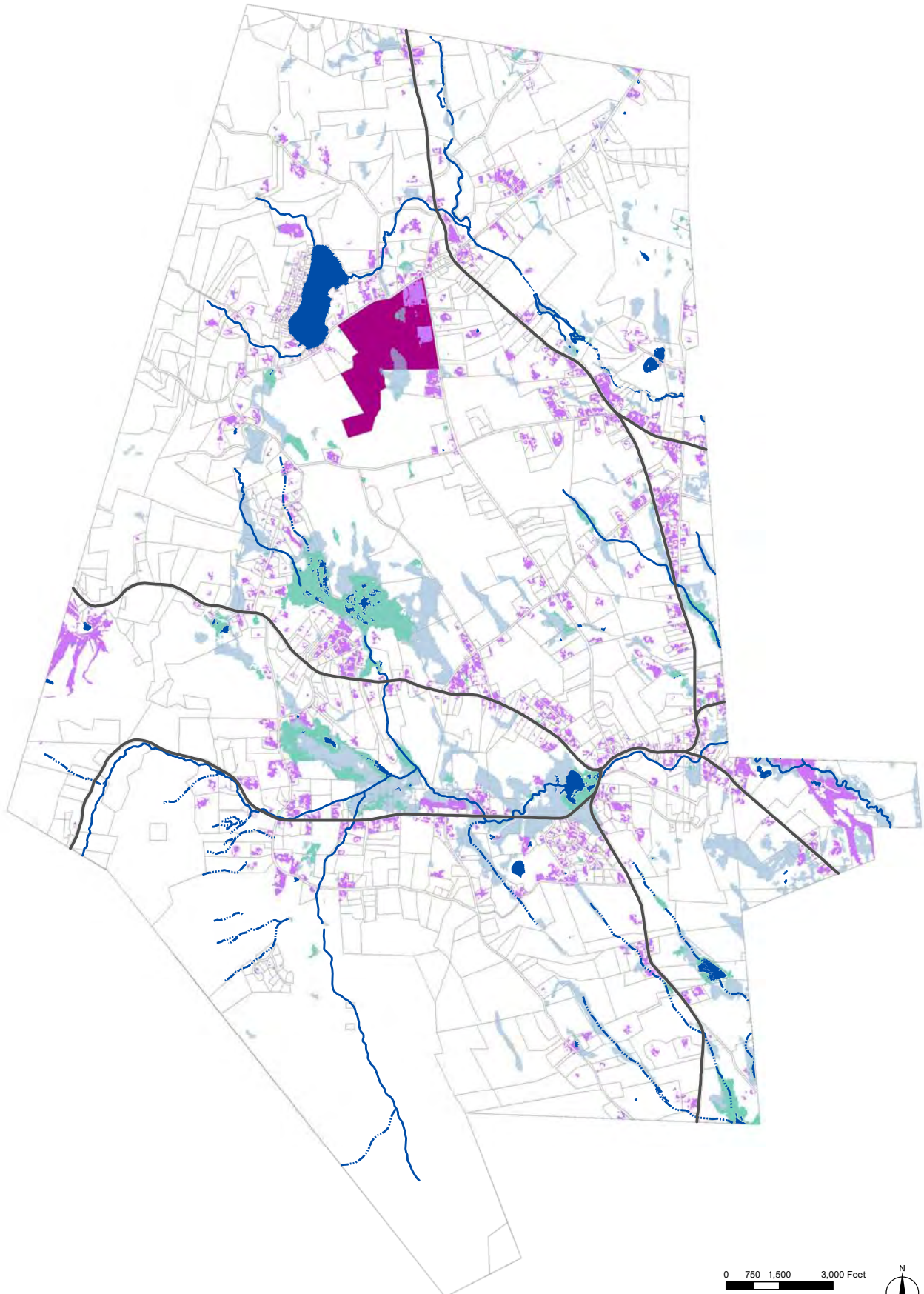
For the first growing season following seeding (2022), all seeded areas should be closely monitored for growth. When the average height of vegetation in a seeded area is approximately 12 inches, the area should be weed whacked or brush hogged to a height of no less than 8 inches. This schedule should continue throughout the first, and possibly second growing season.

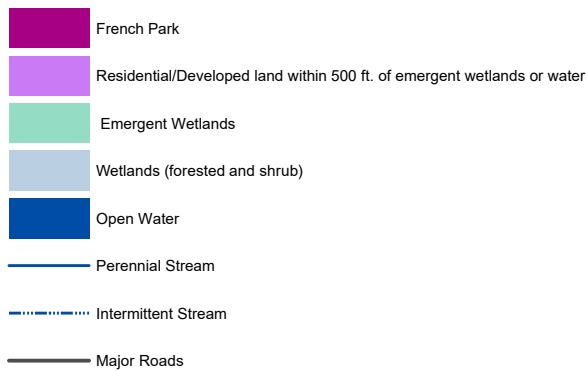
In the second growing season (2023), the seeded areas should be periodically assessed by a botanist or other individual with vetted plant identification skills. If the majority of vegetation in a given area is native species from the seed mixes, then the mowing schedule for that area should transition to a once-a-year mow. This should always occur during the dormant season (after November 15 or before April 1), after plants have gone to seed or before they begin next season's growth. Ideally, the site would be broken up into 2 or 3 mowed sections, with each section mowed once a year on a rotational basis. During this annual mow, vegetation should be cut to a height of 6-8 inches.

If during the second growing season, the majority of vegetation in a given area appears to remain non-native grasses and/or weeds, then continue mowing to keep the overall height of plants between 8-12 inches. This regime should be followed until the third growing season.

By the third growing season (2024), the site should be ready for transition to an annual mow on a rotational basis as described above. Invasive species and early successional trees should be closely monitored throughout the 3-5 year establishment period, and either manually grubbed using a weed wrench; mechanically grubbed using a brush grubber mounted on a tractor, ATV or pickup truck; or applied with herbicides in a cut stump treatment, by a licensed pesticide applicator.

SITES IN EGREMONT SUITABLE FOR REPLICATION
OF FRENCH PARK DESIGN FEATURES





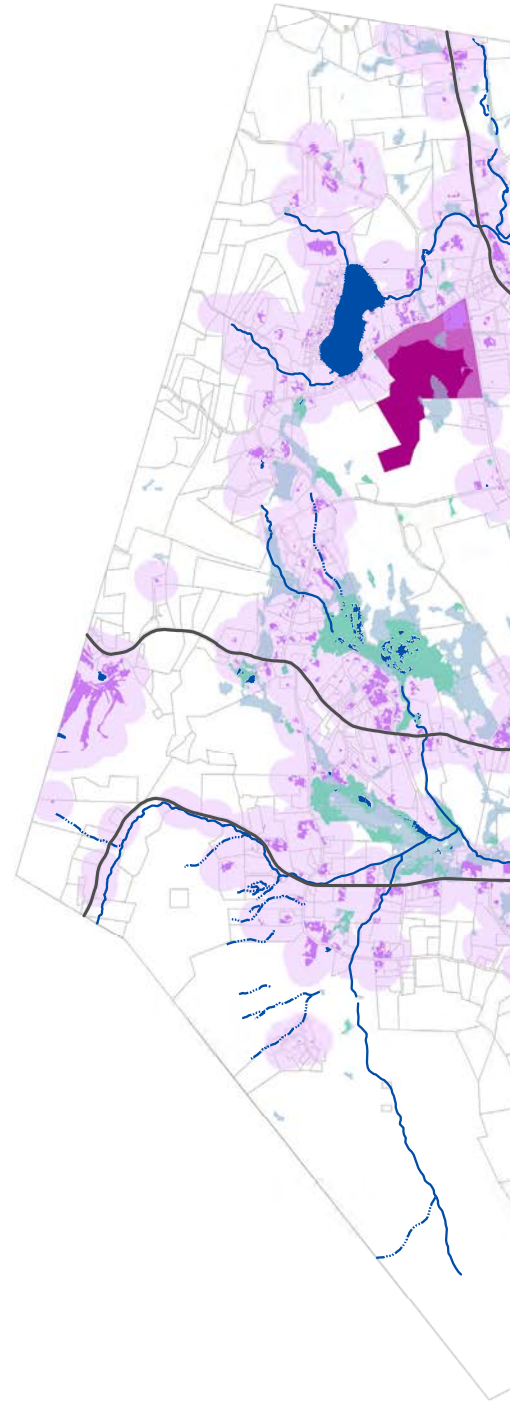
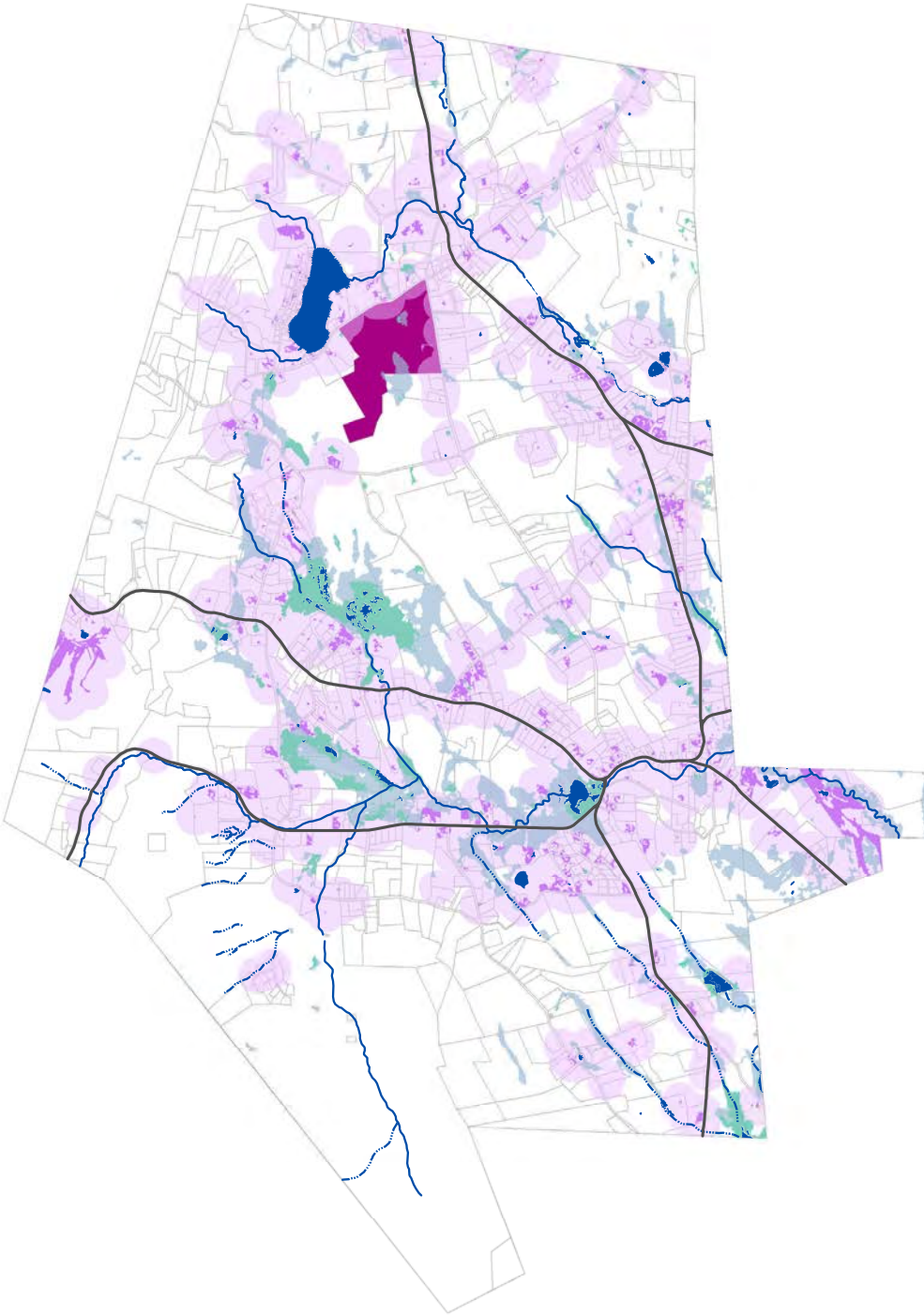
Replication Opportunities

The maps on the following pages represent opportunities for replication of the French Park Pollinator Pathway design on properties across Egremont. By focusing on residential and developed land within 500 feet of emergent (non-forested) wetlands or open water, the design areas and corresponding plants outlined on the previous pages can be implemented on similar sites across town and throughout the region, creating the building blocks for a corridor of biodiversity and ecological resilience by specifically targeting at-risk pollinator species.

POLLINATOR CORRIDOR PROJECTIONS IN EGREMONT
BASED ON TOWN-WIDE LEVEL OF PARTICIPATION

25%

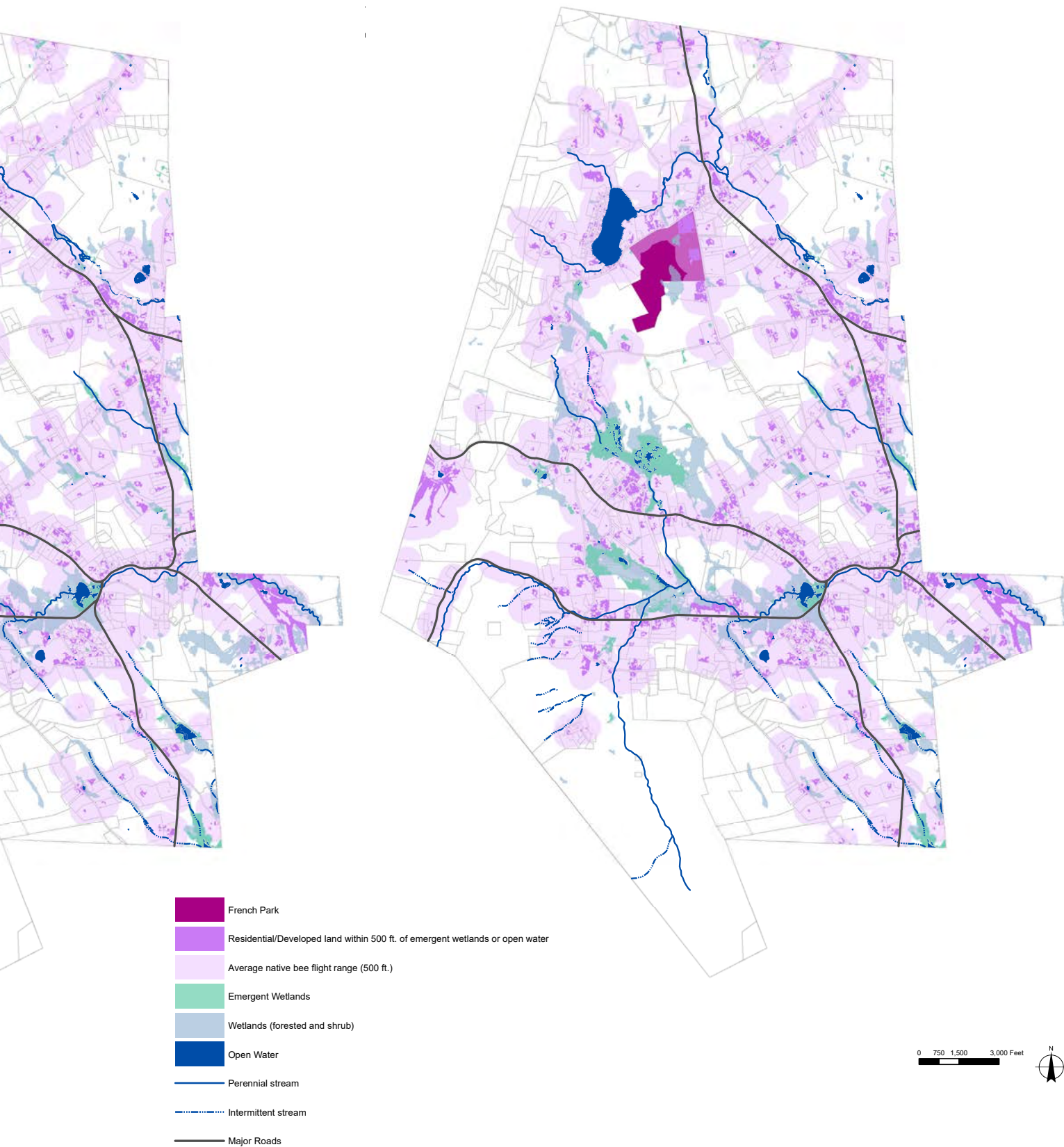
50%



Left to right: maps showing 25%, 50% and 100% of all residential and developed land in Egremont within 500 feet of emergent wetlands or open water, with 500 foot buffers representing the average foraging range of a native bee.

0%

100%



Best Management Practices



1. No Chemicals

Eliminate pesticide use, particularly those containing neonicotinoids. Herbicides and chemical lawn treatments can also be highly damaging to pollinators.

Avoid planting in areas previously contaminated by pesticides or without a spatial buffer from areas where pesticides are applied (at least 100' wide forested buffer is recommended).

Ensure plants and seeds come from a clean, pesticide-free source. Many commercial nurseries treat their plants and seeds, oftentimes before retailers receive them. Some pesticides and most neonicotinoids persist in plants and soil for months to years.



2. Diverse Native Plants

Plant straight native plant species. Cultivars and exotic plants largely do not support the pollen and nectar preferences of threatened pollinators and tend to be visited by common pollinator species whose populations are stable.

Include a range of plant types (trees, shrubs, forbs, grasses, sedges) with varying bloom times, to ensure pollen, nectar and host plants are available across the entire growing season.



3. Create Nesting Opportunities

Seventy percent of native bee species are ground nesting. Mulch using compost or natural materials (e.g. chopped leaves, seed-free hay, composted wood chips) and leave bare areas of well-drained soil in sunny locations.

Thirty percent of native bees are cavity nesting. Allow dead trees, snags and pithy stemmed plants such as raspberries to remain standing.

To benefit bumblebees, maintain small brush piles. This will provide cover for rodents that will in turn create nesting habitat for bumblebees. Where possible, leave leaf litter in gardens and allow it to build up over time. This provides cover for overwintering queens. Barns with unbaled hay or a dry, protected cavity containing hay, straw, clumps of moss or grass located above or below ground are also ideal.

As with other ground nesting bees, limiting or eliminating tillage practices will limit the potential of harming bumblebees.



4. Be Messy

Skip the fall clean up, allowing dead stems, leaves and seed heads to stand over winter, and wait until evening temperatures consistently reach 50 degrees before raking in the spring.

Don't be overzealous when it comes to tidying up. Some "weeds" act as host plants for caterpillars, such as lambsquarters (*Chenopodium album*) for common sootywing (*Pholisora catullus*) and Queen Anne's lace (*Daucus carota*) for black swallowtail (*Papilio polyxenes*).



5. It Doesn't Stop with Planting

That being said, with new plantings, water and weed regularly for the first two years.

To deter deer and rodents until plants fully establish, it may be helpful to construct temporary fencing or set up netting. Natural repellent sprays such as *Plantskydd* can be effective when applied regularly. Thorny plants such as roses can also deter deer browse and function as natural fences for more vulnerable plants.



6. Last But Not Least

Put something in place to catch rainwater, with a dirt base to simulate a puddle, providing pollinators necessary minerals. Make it last between rainy days.

Keep night skies dark for moths and other nocturnal insects: motion-detecting lights or lamps facing down instead of spotlights on all night.

Some plant species establish best by direct seeding: while late fall or early winter is the best time to sow, early spring seeding is also possible, although some species may not germinate until the following year.

References and Further Reading

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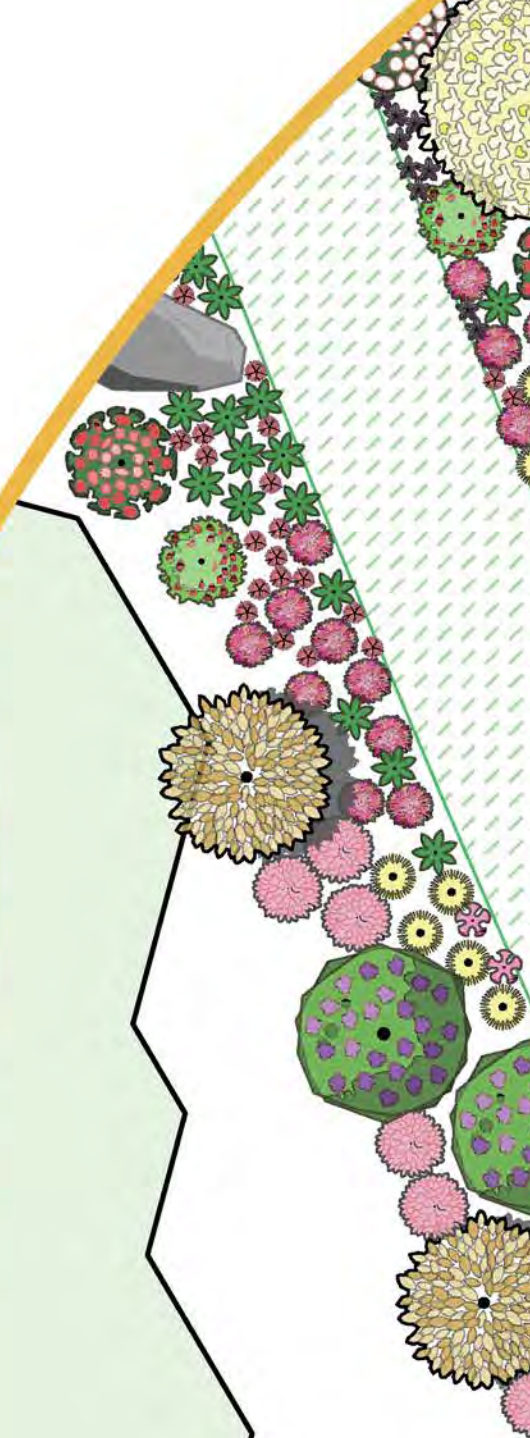
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